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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,036	01/29/2004	Christophe Chau	PET-2122	2439
23599	7590	10/23/2006	EXAMINER	
MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201			FORTUNA, ANA M	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/766,036	CHAU ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ana M. Fortuna	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### **Status**

- 1) Responsive to communication(s) filed on 28 July 2006.
- 2a) This action is **FINAL**.                                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### **Disposition of Claims**

- 4) Claim(s) 1-7,9-16 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-7, 9-16, 18 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### **Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### **Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### **Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____.	6) <input type="checkbox"/> Other: _____.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. Claims 4, 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 4 is incomplete; the term "composite membrane" is incomplete because it does not limit the claim to specific inorganic materials. The claim is also unclear as to whether composite of the selected list of inorganic materials is intended.

In claim 6, the term "strictly" in line 2 does not limit the range of "less than 2 nm", the claim is unclear as to "2nm" is intended (see claim 7, directed to a range with lower limit of 2 nm).

2. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131

USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 18 recites the broad recitation "29 C to 550 C" in step b), line 5, and the claim also recites " the temperature employed in step b) being higher than that employed to carry out step a)" which is the narrower statement of the range/limitation. Although the broad range of temperature is disclosed as being from 20 50 550 degrees C, which has the same lower range of step a), the same claim includes a lower range that is higher than the range of temperature in step a), which has to be higher than 20 degree C, because the lower range in step a) is 20 degrees c.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1-7, 9-16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shadman (US 6,637,544) in view of applicant's disclosure. US'544 teaches a membrane made from the same support, e.g. Membralox®, which inherently has the graded asymmetric porosity capable of retaining different carbon percentages within the pore volume of the graded porosity regions; the membrane has a carbon content which produces a carbon thickness on the pores of the support equivalent to the thickness produce in the present invention, e.g. a carbon layer of between 20 and 100 Angstroms

(0.002 to 0.01 microns)(2 to 10 nanometers (see column 12, claims 1, 14 and 15; column 9, lines 35-55). Selecting the support with a pore size of from 2 to 5 microns, and forming a layer of 0.01 microns on the support, produces a pore size of less than 2 microns the pore size will result of a size of 1.99 (0.0019 nanometers).

Applicant's discloses, (see specification page 10, last paragraph through column 11), the support membrane as known in the art, e.g. Membralox ®, which posses an inherent graded porosity. US'544 does not teach the percentage of carbon at each graded pore section of the membrane. One skilled in this art at the time this invention was made can expect the same amount of carbon content at a predetermined porous region of the membrane, when the same substrate pore size is selected for the Membralox ® membrane, and the same coating thickness is applied to the membrane pores, because the region of the membrane with the less amount of pores are expected to retain the lower amount of carbon the pores.

The total amount of carbon in the present invention, seems to be equivalent to the amount of carbon of us'544, because the reduced the pores of the support within the same level e.g. to a pore size that is less than 2 nanometers (0.002 microns).

As to claims 4-5, the membrane include the materials claimed and is supported (see column 9, lines 35-35-37). Regarding to claim 7, the final membrane based on the teaching of US'544 will be able to tailor the final membrane pore size as desired depending of the final membrane flux desired, and depending on the base membrane pore size selected.

The membrane of US'544 is not made by the process of claim 18 and dependent claims 8-11, however, product by process as products, and the product of patent US'544, appears to substantially meet the carbon distribution in the Membralox ® support as discussed above. See

In SmithKline corp. v. Apotex Corp., No. 04-1522 (Fed. Circ. February 24, 2006).

Once a product is fully disclosed in the art, future claims to the same product are precluded, even if that product is made by a new process."

The use of the membrane is also disclosed in US'544 (see column 7, lines 20-063).

Regarding claim 14-16, the membrane of US'544 also includes metallic sites with are capable of reacting, or catalyzing a reaction between contaminants present in the treated hydrocarbon and the metal compound present on the membrane (see column 9, lines 17-33, column 7, lines 2-68 and column 8, lines 108). It would have been obvious to one skilled in the art at the time this invention was made to contact the permeate treated with the membrane of US'544 in multiple steps, to produce further reaction of the contaminants with the membrane and improve the degree of purification. The metals or catalysts present in the membrane are for example manganese, lithium (see column 4, last paragraph bridging column 5, first paragraph).

### ***Response to Arguments***

5. *The allowability of the limitation of claim 17 in paper of 5/23/06 has been withdrawn, base on a more closed review of the structure of the support or asymmetric membrane used in the process, which applicant disclosed as known in the art, e.g Membralox ®, which is disclosed in '544 as the support for proving a carbon inside the*

*pores to reduce the pores of the support. The thickness of the carbon layer coating the pores of the support as discussed in the rejection above, indicates that the same amount of carbon may be present within the pores of the same support in the present invention.*

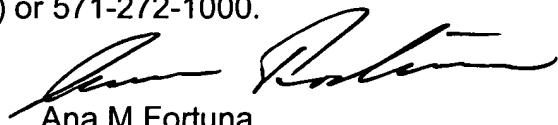
***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. 5,829,139 teaches a process of making carbon from a hydrocarbon within the pores of a porous inorganic membrane. US 5,190,654, , 6,090289, 6,140,263, 5,723,397, and 5,635,148 are cited as representing the state of the art in producing carbon within the pores of membranes.

7. *Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M. Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.*

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Ana M Fortuna  
Primary Examiner  
Art Unit 1723

AF  
October 13, 2006